

THE EADS MICROPACK PROJECT

A NOVEL, FLEXIBLE APPROACH TO PACKAGING INTEGRATED MICROSYSTEMS FOR SPACE APPLICATIONS

Steven ECKERSLEY¹, Oudea COUMAR², Josef SCHALK³, Martin KLUGE³

¹EADS Astrium Ltd, Stevenage, UK;

²EADS ST, Les Mureaux, France;

³EADS Corporate Research Centre, Ottobrunn, Germany

ABSTRACT :

EADS recognises the potential for Microsystems Technology (MST) to disrupt and revolutionise the space industry, where it can dramatically reduce mass, size and power requirements and therefore mission cost. Therefore EADS is developing a novel modular approach to packaging integrated microsystems for space applications called ‘micropacks’.

The micropack include suites of COTS MST sensors, packaged and integrated into a 3D modular multi-layer ceramic package. This introduces flexibility and means that this impressively light and compact micropack technology can be adapted to form the basis as a solution for a range of exciting future mission concepts such as:

- Highly integrated multi-functional nanosatellites (e.g. for Solar Terrestrial Physics or Space Weather monitoring)
- Planetary aerobots on Mars, Venus, the Giant Planets and Titan (e.g. as a payload/system package)
- Sub-100g planetary microprobes for measuring atmospheric profiles
- Solar sails (e.g. as the central hub of the spacecraft)
- Penetrators (e.g. as a payload/system package)
- Robotic planetary explorers (e.g. landers, rovers, walkers, hoppers)

The micropack consists of 5 ceramic layers, consisting an atmospheric sensor unit (e.g. pressure sensor), acceleration sensor unit, power supply unit, data handling unit (a Texas Instruments MSP430 micro controller), or a chipsize RF transceiver unit laminated into the ceramic (an interesting new approach). Each module has a standardized interface, which ultimately combines with other modules to form a system platform. The size of the micropack will be approximately a mere 20x25x25mm³, with power consumption of less than 100mW and of mass just 25g.

Report Documentation Page			Form Approved OMB No. 0704-0188	
<p>Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p>				
1. REPORT DATE 13 JUL 2005	2. REPORT TYPE N/A	3. DATES COVERED -		
4. TITLE AND SUBTITLE SA Novel, Flexible Approach To Packaging Integrated Microsystems For Space Applications			5a. CONTRACT NUMBER	
			5b. GRANT NUMBER	
			5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)			5d. PROJECT NUMBER	
			5e. TASK NUMBER	
			5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) EADS Astrium Ltd, Stevenage, UK			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)	
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited				
13. SUPPLEMENTARY NOTES See also ADM001791, Potentially Disruptive Technologies and Their Impact in Space Programs Held in Marseille, France on 4-6 July 2005. , The original document contains color images.				
14. ABSTRACT				
15. SUBJECT TERMS				
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	18. NUMBER OF PAGES 2	19a. NAME OF RESPONSIBLE PERSON

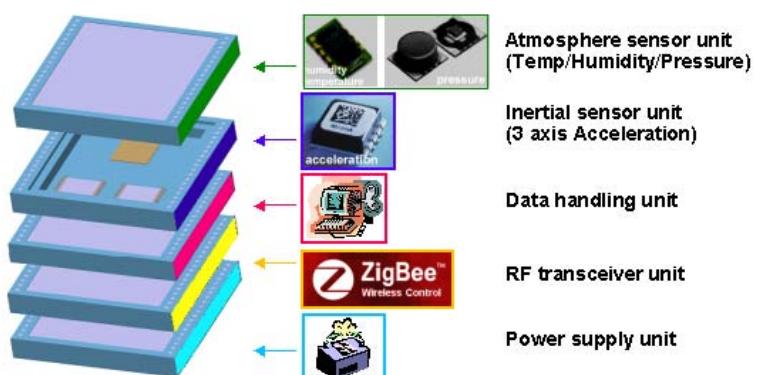


Fig 1. Micropack Concept

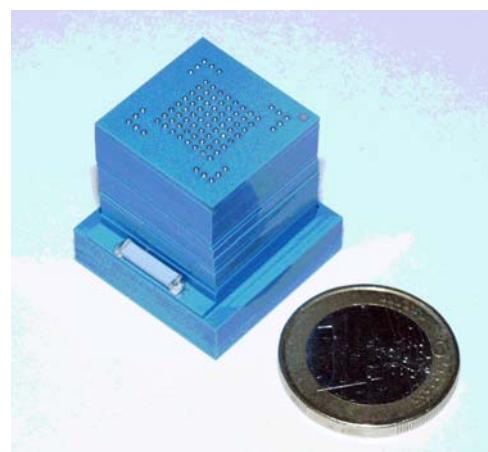


Fig 2. EADS Micropack 2005

Contact Information:

Steven Eckersley,
EADS Astrium Ltd,
Tel.: +44 (1438) 773301,
Email: steven.eckersley@astrium.eads.net

Martin Kluge,
EADS Corporate Research Germany,
Tel.: +49 (89) 607 20624,
Email: martin.kluge@eads.net